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ABSTRACT

Examined were the effects of four teachers' use of a data-based behaviorally oriented planning technique on the verbal labeling performance of eight developmentally delayed children (2-5 years old). Teachers were introduced to a 10-tactic planning technique that included behaviors ranging from simply counting the number of correct and incorrect child responses, to conducting trend analysis and formal error analysis. Teachers were questioned daily regarding their use of the 10 tactics and were observed in using consequating events following a child error response. Results indicated that the planning technique increased correct, and decreased incorrect rates of students' responding. (Author/CL)

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The Effects of Teacher Planning and Error Analysis On Simple Verbal Labeling By Developmentally Delayed Preschool Children

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Abstract

The effects of teachers' use of a data-based behaviorally-oriented planning technique on child performance during simple verbal labeling was examined using a multiple-baseline design. Teachers were introduced to a ten-tactic planning technique that included behaviors ranging from simply counting the number of correct and incorrect child responses, to conducting trend analysis and formal error analysis. Teachers were questioned daily regarding their use of those ten tactics. They were also observed concerning their use of consequating events following a child error response. Results of this study indicate that implementation of the planning technique increased pupil correct, and decreased pupil incorrect rates of responding. Also, changes in teacher use of specific consequating events was observed, although those changes were mainly idiosyncratic.

The Effects of Teacher Planning and Error Analysis On Simple Verbal Labeling By Developmentally Delayed Preschool Children

To date, research supports the importance of using systematic planning and instructional procedures in teaching mentally retarded students reading, mathematics, and language usage. Essential components of such procedures include specification of termainal objectives and performance criteria, as well as data-based progress monitoring (Brown, 1973).

Burney (1976) incorporated those procedures with error analysis and trend analysis into a ten item precision lesson-planning technique, demonstrating a significant relationship between teacher use of that data-based instructional planning technique and pupil performance on mathematics worksheets.

In a partial replication of the study by Burney (1976), Kerr and Strain (1977) demonstrated the effects of the planning intervention (with the exclusion of error analysis) across two academic areas, math and oral reading. They report not only improved pupil performance upon implementation of the planning technique, but increases in the teacher trainees' use of contingent praise concomitant with their increased level of planning.

One purpose of this study was to demonstrate experimental control over teacher use of a specific data-based planning technique. This study is a systematic replication of previous studies (Burney, 1976; Kerr and Strain, 1977) with the following exceptions: while previous studies assessed pupil performance on paper-and-pencil mathematics and reading tasks,

the present study assessed performance on simple verbal labeling. Also, while prior studies utilized pre-adolescent behavior disordered and adolescent mentally retarded subjects, the present study used developmentally delayed preschool and toddler children as subjects.

While prior studies have investigated the effects of a total nine or ten behavior intervention package, a second purpose of this study was to examine the effects of error and trend analysis as a set of planning tactics used in addition to the eight other planning behaviors used by Burney (1976) and Kerr and Strain (1977).

Finally, previous studies have investigated the effects of their data-based planning technique on teacher use of consequent contingent praise (Kerr and Strain, 1977), and contingent praise and teacher use of negative statements (Burney, 1976). The present study examined the relationship between the teachers' use of the planning technique on their use of a series of consequence events following a child correct or error response.

Method

Subjects and Setting

This investigation was conducted with four in-service teachers of developmentally delayed preschool children at the John F. Kennedy Experimental School, George Peabody College, Nashville, Tennessee. In each of two classrooms two teachers and four children participated. Teacher A received certification in mental retardation but had no in-service teaching experience prior to this study. The ages of her two

pupils were 5 yrs. and 5 yrs., 5 mos. Teacher B had 3 years of previous teaching experience. Her pupils' chronological ages were 2 yrs., 10 mos., and 3 yrs., 7 mos. Teacher C had previously worked for 2 years with severely and profoundly retarded children. Her pupils were aged 3 yrs., 8 mos., and 5 yrs., 6 mos. Teacher D had experience working with autistic children for 2 years. Her pupils ages were 2 yrs., 4 mos., and 3 yrs., 10 mos.

None of the teachers had previous exposure to the planning techniques that made up the intervention package with the exception of Teachers A and D who had limited exposure to graphing pupil performance. At the time of this study none of the teachers were using any specific tactic in their planning routine.

All children were selected for inclusion in this study based on their demonstrating the ability to imitate at least single words.

Behavioral Measures and Observational Procedures

Teacher Planning Behaviors. Each morning, prior to the first language session, each teacher was interviewed to determine whether or not she had used any of the ten specific planning behaviors in preparing for each of her pupil's lessons for that morning. Table 1 lists the questions that were asked in both the interview format above, as well as in written form where the teacher had to state in writing how she was implementing the planning tactic with each pupil.

Insert Table 1 About Here

Using a set of predetermined criteria a data collector scored each of the written answers to determine the documented and appropriate use of each of the planning behaviors.

Child Responses. Child correct and error responses were recorded throughout all phases of the study by both the teacher and a trained data collector. Immediately after each session, the data collector checked his or her ratings of correct and incorrect responses with the teacher's data sheet. Essentially perfect agreement occurred.

Teacher-Child Interaction. The final source of data was in the form of direct observation of all teacher responses following a child correct or incorrect response. Table 2 contains a list of the possible teacher consequent responses. Using a frequency recording system, the data collector first recorded the child responses as being correct or incorrect, and then recorded the teacher consequent event immediately following the child response.

Insert Table 2 About Here

Reliability checks were conducted on 31% of observations throughout the study. A mean of 94.9% and a range from 82-100% agreement was obtained. Percentage agreement between the two observers was calculated by dividing the total number of agreement of child responses and teacher consequent events by the total number of agreements plus disagreements. Most often, the disagreements occurred because one of the data collectors failed to hear or see a child response, thus missing the opportunity to correctly record the teacher consequent event as following a correct or error response.

Sessions

Two sessions were conducted daily by each teacher four days per week. Each teacher selected a child from the morning and the afternoon periods with whom to work. Each session consisted of three random presentations of four training words which were chosen in accordance with the procedures detailed in the Language Intervention Program manual of the Early Development and Assistance Program (Note 1). No session lasted more than ten minutes and the average session time was approximately six minutes. Although half of the children participating in this study were involved in language training in the morning and half the children in the afternoon, the time of day each child received his or her training was held constant throughout the study.

Intervention Procedures

Intervention procedures for this study consisted of 1) intervention on teacher planning behaviors, and 2) for Teacher D, a second intensive session specifically detailing the appropriate use of the ten planning behaviors. The major intervention was a booklet describing how to implement the ten planning behaviors (Note 2). As each teacher moved into the into the intervention phase of this study she met with the researchers for a three hour session in which the implementation of each behavior was explained. Special emphasis was placed on the teacher documenting her use of antecedent planning behaviors, the recording of child responses using data sheets adapted from the Language Intervention Program manual (Note 1), and her documenting the use of consequent behavior management procedures prior to each language training session. Besides focusing on trend analysis (White, 1971), the intervention booklet stressed the importance

of the teacher formally analyzing the child's errors according to specific errors according to specific error patterns. Table 3 lists the three major catagories of error patterns that may occur during language training.

Insert Table 3 About Here

Following the initial intervention session with the teachers, although they were given clarification statements concerning the ambiguity of the wording in the intervention booklet, care was taken not to give the teachers reinforcement, or disapproval, for not implementing any or all of the planning behaviors. The objective for the intervention was to provide the teachers with the means with which they could use the planning technique systematically, but without advising them as to which behaviors should be used or in what order.

Design

A multiple baseline design was employed across teachers, across children. Teachers were moved from baseline to intervention on the basis of achievement of a stable state of performance concerning their use of the planning behaviors during the baseline phase.

Baseline. During this phase teachers were instructed to conduct formal language training sessions using the Language Intervention Program manual (Note 1) as a procedural guide. The teachers were questioned daily concerning their use of the ten planning behaviors and interaction data was collected on each teacher and pupil.

Intervention. This phase differed from basiline only in the introduction of the intervention booklet (Note 2). Measurement of the teachers' use of the planning behaviors, child performance, and teacher-child interactions continued. The purpose of this phase was to demonstrate that the use of the planning behaviors would have an effect as a means of antecedent control which would in turn affect child performance as well as teacher use of consequent events.

Results

Teacher Planning Behavior

The first and third graphs on Figures 1 and 2 show the number of planning behaviors judged by the data collectors as being used by the teachers in planning for each day's training sessions for each child.

Insert Figures 1 and 2 About Here

While Teachers A and C implemented the behaviors as a total package within the first few days of intervention, Teacher B selectively focused on all behaviors except 8, 9. and 10 until day 26. Teacher D neither systematically used a group of planning behaviors, nor adjusted her teaching tactics as a result of the information she had been recording from the planning behaviors she was inconsistently using, until a second intervention phase was implemented.

Child Correct and Error Rates and Teacher Planning

The second and fourth graphs on Figures 1 and 2 show the mean correct and error rates of responding for each teacher's children. In all cases there is a distinct separation of correct and error rates during the final days of intervention. In addition, once the correct rates began to rise, and the error rates began to decrease, this trend maintained.

Table 4 shows the mean correct and error rates for each teacher's children during baseline, intervention when 8 or less planning behaviors were being used systematically, and when 9 or 10 planning behaviors were being used systematically. As indicated in the "Corrects" table, there was a demonstrable increase in correct rate of responding for all teachers except Teacher A. However, while Teacher A's pupil's correct rate of responding decreased slightly during the initial days of intervention, those children's correct rate of responding was higher at the termination of the study than the mean rates of the other teacher's children at any time during the study.

The "Errors" table shows the mean error rate of responding for children of teachers as described above. While in most cases the error rates increased during intervention when less than 9 planning behaviors were being used, the mean error rates of Teachers B, C and D, when those

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Insert Table 4 About Here

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teachers were using all ten planning behaviors was lower than during the baseline period. In addition, the mean error rates of all teachers during

this period were lower than during the preceding intervention period when less than 9 behaviors were being used.

Teacher-Child Interactions

Table 5 shows the percentage of teacher use of consequent behaviors following a child correct response during baseline and intervention phases. Four behaviors were observed to make up most of the consequating events:

Insert Table 5 About Here

Praise, Repetition/Expansion, Question/Instruction, and ther Direction. An examination of Table 5 reveals that Praise was the predominant subsequent behavior.

However, Teacher C, and to a lesser extent the other teachers, repeated or expanded upon the child's correct response before praising that response, thus not only praising the child, but providing feedback as to the correctness of the response. By adding the percent of use of Praise to the percent of use of Repetition/Expansion immediately followed by Praise, a high rate of contingent praise and repetition becomes evident. While the planning technique did not result in any changes in teacher use of consequent events following a child correct response, it is of interest to notice the extremely high percent of contingent praise statements ranging from a low of 73 percent to a high of 87 percent. In other words, the teachers in this study systematically and consistently used praise, or feedback-praise statements following a child correct response.

However, the teachers were less homogeneous regarding their use of consequating behaviors following an error by the child. As depicted in

Table 6 each teacher used a different consequent behavior during baseline. Furthermore, each teacher made a demonstrable change in the percent of use of one or more consequent behaviors and direction of change varying from teacher to teacher.

Insert Table 6 About Here

The consequent behavior following child error responses during baseline and intervention phases used by Teacher A was Question/Instruction. However, following intervention Teacher A decreased her use of Negative Statements, and increased her use of Models by 14 percent.

Teacher B used Question/Instruction as a consequent event following an error in both baseline and intervention as did Teacher A, but decreased by 28 percent her use of Models and increased her use of Negative Statements by 27 percent during intervention.

Teacher C likewise used Question/Instruction during baseline, but reduced that frequency by 25 percent during intervention while slightly increasing her use of Models.

Finally, Teacher D used Models consistently during both baseline and intervention, but decreased her use of reinforcement following an error by a frequency of 11 percent. For Teacher D, baseline and intervention phase one were included in this analysis as one phase because she made no demonstrable changes in her behavior until the second intervention phase was implemented.

Discussion

The results of this study replicate previous findings (Burney, 1976; Kerr & Strain, 1977) that it is possible to establish experimental control over teacher use of a specific, behaviorally-defined and data-based planning technique. Although the teachers in the study required varying amounts of time to implement the planning behaviors, and while one teacher required a second intervention session following initial intervention, by the end of this study all four teachers were systematically using all ten planning behaviors.

Second, the results of this study further support the conclusions of prior studies (Burney, 1976; Kerr & Strain, 1977) that teacher use of systematic planning techniques were effective in increasing correct and decreasing error rates of the children's responding. Furthermore, it was shown that while implementation of 8 or less planning behaviors has some effect on pupil performance, systematic implementation of all ten planning behaviors generally resulted in a more dramatic separation of correct and incorrect rates of responding. Specifically, the use of error and trend analysis, the last behaviors to be systematically used by the teachers in this study appear to account for much of the change in pupil performance.

Third, while it was shown that teachers' use of the planning technique did not influence changes in the high percent of teacher use of praise or feedback-praise behaviors following a child correct response, there were demonstrable changes in teacher consequent behaviors following a child error, although those changes were largely idiosyncratic. It appeared that each teacher drew different conclusions from the information gained through the use of the planning behaviors, and so each teacher changed her use of

consequation events depending on the error and trend analysis data.

The present study demonstrated that the use of a systematic data-based planning procedure is feasible for the instruction of an essentially pre academic task. This suggests that, in addition to the academic paper-and-pencil tasks which were investigated in previous studies (Burney, 1976; Kerr & Strain, 1977), this planning procedure may be effectively applied to pre-academic and non academic tasks. Furthermore, it is effective in planning for the instruction of young, developmentally delayed children, as well as for pre-adolescent and adolescent mentally retarded and behavior disorder children (Burney, 1976; Kerr & Strain, 1977).

In contrast to prior studies, the present study demonstrated control, without direct daily shaping or regular consultation, of the behavior of all four teachers (although a brief second intervention phase was necessary for Teacher D). Burney (1976) demonstrated control over the planning behavior of 2 of his 3 teachers after using direct shaping with one of the two. Although Kerr & Strain (1977) demonstrated control over the planning behavior of all three teacher-trainees, regular twice-weekly meetings of the trainees with consultants took place throughout the intervention phase. (Also, if the contingencies which apply to pre-service teacher differ from those of in-service teachers, this probably contributed to the degree of control reported by Kerr and Strain (1977).) The present study suggests that, while it may be more difficult to gain control over the behavior of in-service teachers, it is possible to do so without direct shaping and/or regular consultation.

Because the present study revealed that error and trend analysis appeared to account for much of the change in pupil performance, future development and research on data-based planning procedures should be directed at eliminating unnecessary or redundant components of such a procedural package. Specifically, the first eight behaviors listed in Table 2 may be deleted or incorporated into a more efficient, less time consuming procedural package.

Fianlly, while this group of teachers used praise contingently and consistenly, they were less systematic in their use of consequation events following a child error. Clearly, they appear to have been taught appropriate procedures in responding to a child's correct answer, while demonstrating inconsistencies in responding when the child erred. Thus, further research is needed to not only refine prodedural methods for analyzing child errors, but in empirically validating appropriate responses teachers may use in consequating error responses in language training.

Reference Notes

1. Language Intervention Program of the Early Development Assistance Program. John F. Kennedy Center, Experimental School, George Peabody College, Nashville, Tennessee (Working Copy), 1976.

2. Young, C. C. Error Analysis and simple language training. Field-based training module, George Peabody College, Nashville, Tennessee, 1977.

References

Burney, J. D. Effects of teacher use of a precision lesson-planning technique on instructional interaction and pupil achievement. Unpublished doctoral dissertation, George Peabody College for Teachers, 1976.

Brown, L. Instructional programs for trainable level retarded students. In L. Mann & D. Sabatino (Eds.), The first review of special education. Philadelphia, Pa.; JSE Press, 1973.

Kerr, M. M., & Strain, P. S. Use of precision planning techniques by teacher trainees with behaviorally disordered pupils. Behavior Disorders, In Press.

White, O. R. The "split-middle": A "quickie" method of trend estimation. Eugene, Oregon: University of Oregon, Regional Resource Center for Handicapped Children, 1971.

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Table 1

Teacher Planning Behaviors

1. Counting number of right and wrong responses.
2. Observing if same stimulus was missed more than one time.
3. Describing how today's responses compared with previous responses, and any conclusions reached.
4. Describing how the procedures used by the child to respond to each stimulus were analyzed.
5. Recording the time the child took to complete the training session.
6. Describing the teaching techniques used with the child, and how they may differ from other children being taught.
7. Describing performance criteria set for the child based on previous performance.
8. Graphing the data.
9. Describing the analysis of the graphs, particularly the relationship of yesterday's data to trend lines, and the relationships of correct and error points.
10. Describing the error analysis of the child's responses, both for yesterday's data and for the last several days.

Table 2

Coding Definitions for Interaction Recording System

Q/I Question/Instruction. The teacher asks a question or gives an instruction directly related to the training stimulus (desired response), without prompt or model.

Q/I(Md) Question/Instruction with a model. Same as above except a verbal model or physical model accompnaies antecedent event.

Md Model. The teacher states the desired verbal response, or models the desired motoric response through demonstration. The model is appropriate to the desired response. Note: Q and I are not included in this catagory.

Pt Partial Prompt. Same as Md (Model) except that the demonstrated response is only a partial demonstration of the full child response.

NS Negative Statement. The teacher says "No" or "No, that's not right," or any statement that is negative in intonation or wording.

P+ Positive Reward. The teacher rewards the child's performance by saying "good" or a similar praise statement, and/or by offering the child a token or other tangible reward.

R/E Repitition/Expansion. Repitition refers to simply repeating exactly what the child has said (or done). Expansion is the procedure of responding with a repitition, but enlarging it or making it a bit more complex.

OD Other Direction. Instructions questions, or other behavior by the teacher not directly related to the lesson being taught (i.e., behavior management or other statements such as "Sit down" or "Look at me").

Table 3

Common Errors That Occur In Simple Language Training

No Error Pattern Errors: When the child fails to give a correct response two out of every three times a request to respond is made, and when there is no discernable pattern to those errors.

Error Pattern Errors: When the child fails to give a correct response two out of every three times a request to respond is made, and when those errors are the same.

Chance Error: When the child is correct on two-thirds of the chances to respond, or only one-third of the responses are errors.

Table 4

Mean Correct and Error Rates for Children During Baseline and During Intervention when a) 8 or Less and b) 9 or 10 Planning Behaviors Were Being Reported

Teacher	Correct Rate			Error Rate		
	Baseline	8 or less	9 or 10	Baseline	8 or less	9 or 10
A	3.69	3.55	5.47	1.88	3.03	2.05
B	1.91	4.03	4.94	2.19	2.04	1.39
C	3.29	4.02	4.71	1.76	2.17	1.14
D	1.58	2.03	3.21	2.90	2.91	1.54

Table 5

Percentage of Teacher Responses During Baseline and Intervention Following Pupil Corrects

Teacher Consequent Response (1)							
Tchr	Phase	P+	R/E P+	R/E	QI	OD	other
A	Base	82	5	4	3	6	0
	Int	79	2	2	10	4	3
B	Base	56	19	6	13	5	1
	Int	66	7	4	14	7	2
C	Base	55	28	3	12	2	0
	Int	38	42	2	16	2	0
D	Base	83	2	2	3	4	6
	Int	83	1	2	2	5	7

(1) See Table 2 for a description of each consequent event.

Table 6

Percentage of Teacher Responses During Baseline and Intervention Following Pupil Errors

Teacher Consequent Response (1)										
Tchr	Phase	QI	QI^{m}	Md	Pt	P^{+}	R/E	NS	OD	Chld (2)
A	Base	41	07	08	06	06	03	20	07	02
	Int	36	10	22	05	03	03	06	13	02
B	Base	30	01	54	03	04	01	02	04	01
	Int	24	03	26	01	03	01	29	11	02
C	Base	34	42	15	01	03	01	01	02	01
	Int	09	46	24	01	04	04	03	06	03
D	Base	09	11	34	12	21	01	01	10	01
	Int	15	02	39	18	10	01	02	10	03

(1) See Table 2 for a description of each consequent response.
(2) These are behaviors made by the child following his or her error before the teacher consequated that error.

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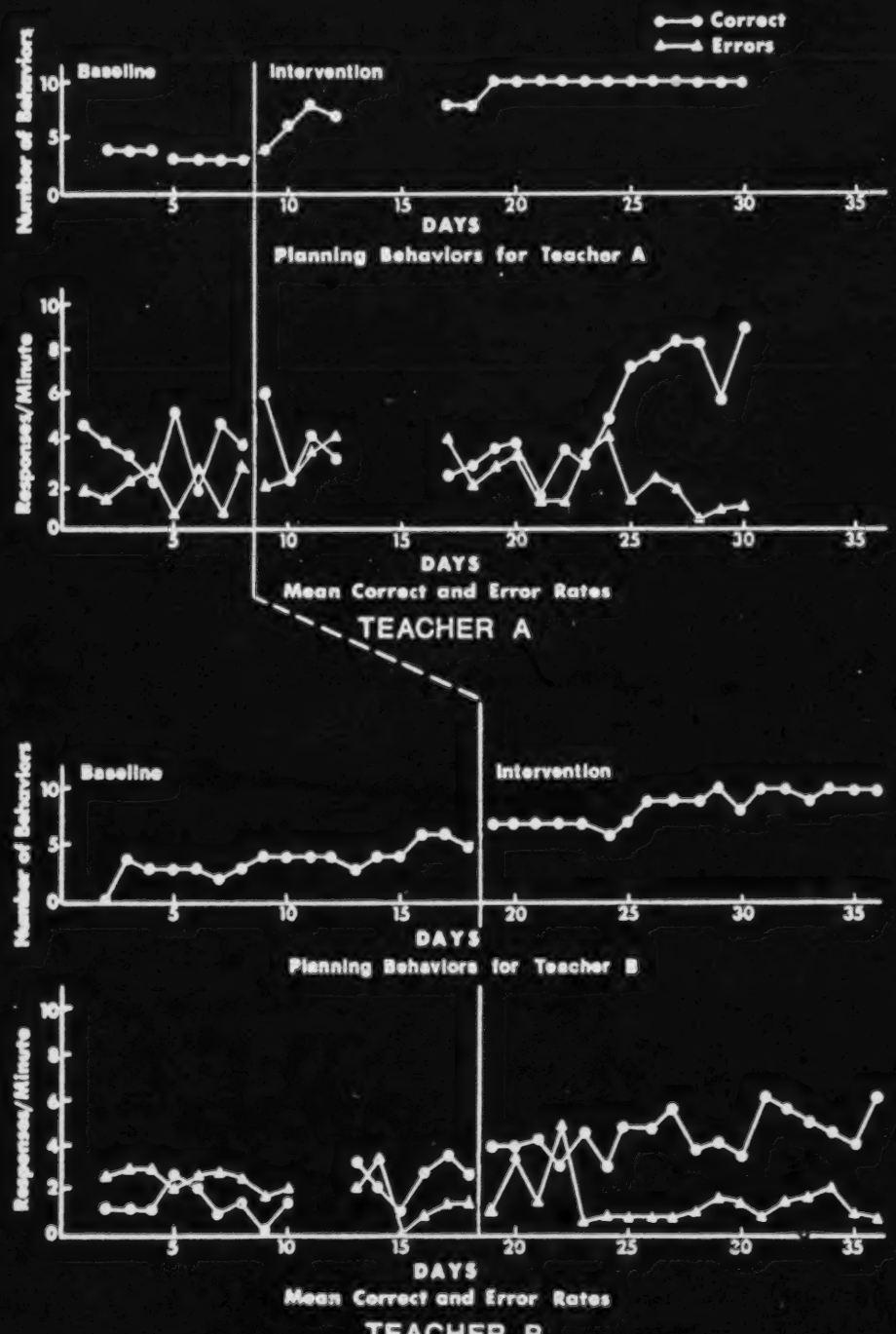
Figure 2. Planning Behaviors and Mean Pupil Correct and Error Rates For Teachers C and D.


Correct
Errors
Baseline
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Number of Behaviors
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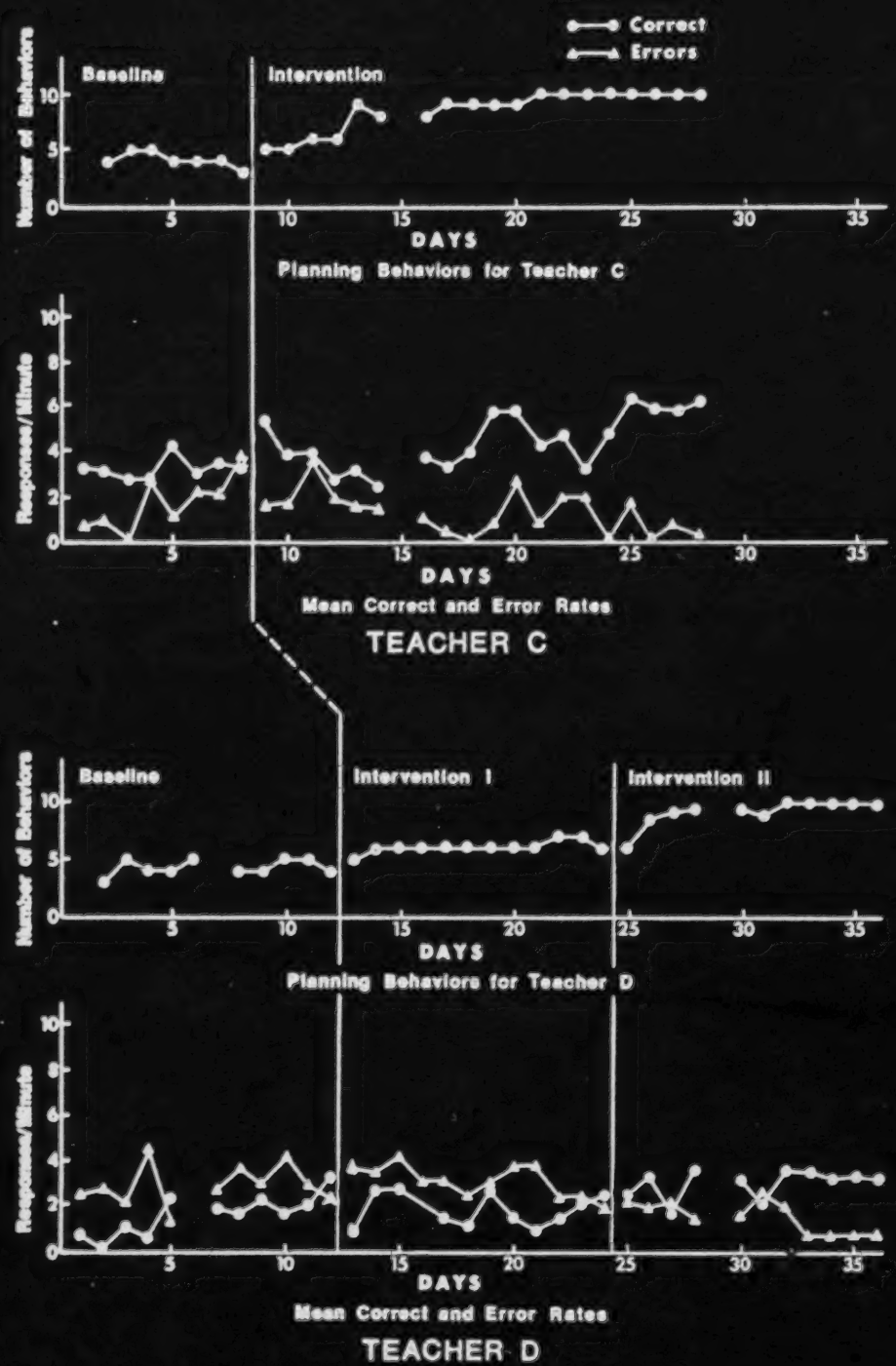
Planning Behaviors for Teacher A
Responses/Minute
DAYS
Mean Correct and Error Rates
TEACHER A
Baseline
Intervention
Number of Behaviors
DAYS
Planning Behaviors for Teacher B
Responses/Minute
DAYS
Mean Correct and Error Rates
TEACHER B

Figure 1


Correct
Errors
Baseline
Intervention
Number of Behaviors
DAYS
Planning Behaviors for Teacher C
Responses/Minute
DAYS
Mean Correct and Error Rates
TEACHER C
Baseline
Intervention I
Intervention II
Number of Behaviors
DAYS
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Responses/Minute
DAYS
Mean Correct and Error Rates
TEACHER D

Figure 2